



MAUL FOSTER ALONGI

2001 NW 19th Avenue, Suite 200 | Portland, OR 97209 | 971 544-2139 | www.maulfooster.com

July 25, 2014
Project No. 8128.01.08

Mr. Dana Bayuk
Oregon Department of Environmental Quality
2020 SW 4th Avenue
Portland, Oregon 97201-4987

Re: *Revised* Monitoring Wells WS-11 and WS-14 Abandonment Plan
Siltronic Corporation
7200 NW Front Avenue, Portland, OR
ECSI No. 183

Dear Dana:

On behalf of Siltronic Corporation (Siltronic), Maul Foster & Alongi, Inc. (MFA) has prepared this letter in response to direction from the Oregon Department of Environmental Quality (DEQ) to abandon nested monitoring well pairs WS-11 and WS-14 on the Siltronic property. This work plan has been revised from a previous version dated February 14, 2014 based on comments and direction provided by DEQ in an email dated June 25, 2014. Direction to abandon WS-14 was provided in DEQ's January 28, 2014 e-mail correspondence to Siltronic documenting a January 27, 2013 telephone conversation. Related submittals to DEQ include a well inspection video log for the WS-14 well pair dated April 25, 2014 and a response to DEQ's email (dated June 25, 2014) in a letter dated June 27, 2014. For reference, MFA's June 27, 2014 letter and DEQ's emails are included in Attachment A.

BACKGROUND

The nested monitoring well pairs WS-14 and WS-11 are located near the north (plant northwest) corner of the Siltronic property as shown in the attached figure. The wells were completed in October 2003 (WS-11) and July 2004 (WS-14) and constructed in accordance with then-approved DEQ and Oregon Water Resources Department (OWRD) design specifications of 2-inch diameter, flush threaded, Schedule 40 polyvinyl chloride (PVC) riser pipe; and 2-inch diameter, stainless steel wire wrapped 0.010-inch slot screen; and 2-inch diameter stainless steel sump.

Monitoring well WS-11-125 was completed to 125 feet bgs and monitoring well WS-11-161 was completed to 161 feet bgs, the same completion depths correlate with WS-14-125 and WS-14-161, respectively. The screened interval is 15 feet in primarily silt and sand for all four wells with a 1 foot sump at the bottom. The monitoring well construction logs are included in Attachment B.

The monitoring well pair WS-11 is identified by OWRD as well log ID "MULT 72126". For monitoring well pair WS-14, the OWRD log "MULT 73686" reports the well number as WS-

13, but the reported well number appears to be incorrect. The correct OWRD well log file for WS-14 is "MULT 73686." The OWRD well logs are included in Attachment C.

Per DEQ direction in their email dated January 28, 2014, a video inspection of the inside of monitoring wells WS-14-125 and WS-14-161 was completed to identify the potential causes for the presence of manufactured gas plant (MGP) dense, non-aqueous phase liquid (DNAPL) in WS-14-161. The video logs were submitted to DEQ on April 25, 2014 for review showing the joints in the WS-14 well pair to be intact. At that time, only the WS-14 well pair was scheduled to be abandoned. In the DEQ email dated June 25, 2014, DEQ directed Siltronic to also abandon well pair WS-11-125 and WS-11-161. The well inspection video logs for WS-14-125 and WS-14-161 are included as a DVD in Attachment D.

MONITORING WELL DECOMMISSIONING

Public and private utility-locating services and other information sources will be used to check for underground utilities before work begins. MFA will coordinate fieldwork to locate possible on-site utilities and piping or other subsurface obstructions. Prior to over-drilling, an air knife will be used to 10 feet below ground surface (bgs) around the wells to verify clearance from potential subsurface obstructions. For reference, site features near WS-11 and WS-14, including known utility lines and monitoring wells, are shown on the attached figure.

The monitoring well abandonment will be conducted in accordance with applicable regulations including Oregon Administrative Record (OAR) 690-240-0510, DEQ Guidance Document titled Groundwater Monitoring Well Drilling, Construction, and Decommissioning¹, and previously approved protocols for abandoning monitoring wells at the NW Natural and Siltronic sites including an OWRD variance to use bentonite or organoclay/bentonite slurry if MGP DNAPL is encountered.

The abandonment procedures will include, but not be limited to, the following:

- Measuring the depth to water, depth to MGP DNAPL, potential product thickness, and depth to bottom of the monitoring well
- Using a sonic drilling rig, over-drilling the 2-inch-diameter PVC/steel monitoring well to the depth necessary to confirm the removal of well construction materials:
 - 10-inch casing will be used from 0 to approximately 126 feet bgs
 - 8-inch casing will be used from 126 feet bgs to 170 feet bgs (approximately)
- Documenting the presence and approximate depth of MGP DNAPL, to the extent practicable

¹ DEQ. 1992. Groundwater Monitoring Well Drilling, Construction, and Decommissioning. Technical Guidance. Oregon Department of Environmental Quality. August 24.

- Confirmation that monitoring well materials have been removed
- Sealing the borehole by backfilling with bentonite or organoclay/bentonite slurry with an approved variance from OWRD (in the event that MGP DNAPL is encountered)
- Surface completion to match the surrounding area

Monitoring well construction materials, soil, decontamination liquid and groundwater generated during the well abandonment will be contained in 55-gallon drums and staged on-site. The material will be properly disposed of off-site based on waste characterization sampling results.

REPORTING

After the monitoring well abandonment activities have been completed, MFA will submit a monitoring well abandonment report to DEQ that summarizes the completion of the monitoring well abandonment.

SCHEDULE

MFA is prepared to begin work immediately upon DEQ review and approval of the proposed approach, subject to availability of subcontractors.

Sincerely,

Maul Foster & Alongi, Inc.



Kerry-Cathlin Gallagher
Project Scientist



James G.D. Peale, RG
Principal Hydrogeologist

Attachment: Figure
Attachment A—Correspondence
Attachment B—Monitoring Well Completion Logs
Attachment C—OWRD Well Logs
Attachment D—Video Log of WS-14-125 and WS-14-161 (DVD)

cc: Myron Burr, Siltronic Corporation
Alan Gladstone, Davis Rothwell Earle & Xochihua, P.C.
Brian Church, Davis Rothwell Earle & Xochihua, P.C.
William Earle, Davis Rothwell Earle & Xochihua, P.C.
Chris Reive, Jordan Ramis

Mr. Dana Bayuk
July 25, 2014
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Project No. 8128.01.08

Keith Johnson, DEQ
Tom Gainer, DEQ
Henning Larsen, DEQ
Matt McClincy, DEQ
Kristopher Byrd, OWRD
Sean Sheldrake, EPA
Lance Peterson, CDM
Scott Coffey, CDM
Bob Wyatt, NW Natural
Patty Dost, Pearl Legal Group LLC
John Edwards, Anchor QEA LLC
John Renda, Anchor QEA LLC
Rob Ede, Hahn and Associates, Inc.

FIGURE





Source: Aerial photograph obtained from Esri ArcGIS Online.

Note:
Locations are approximate
and shown for reference only.



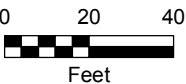
This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Legend

- NW Natural Station
- Siltronic Monitoring Well
- TarGOST Boring
- Utility Line (Siltronic)
- Siltronic Tax Lot

**Figure
Monitoring Well WS-14
and WS-11 Locations**

Siltronic Corporation
Portland, Oregon



ATTACHMENT A

CORRESPONDENCE



Kerry Gallagher

From: BAYUK Dana <BAYUK.Dana@deq.state.or.us>
Sent: Tuesday, January 28, 2014 9:19 AM
To: James Peale
Cc: Burr, Myron; Gladstone, Alan; Church, Brian (BCHURCH@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); Earle, William G. (WEARLE@davisrothwell.com); Kerry Gallagher; BYRD Kristopher R; LARSEN Henning
Subject: RE: Siltronic - Conversation Confirmation

Good morning James.

This e-mail confirms that during our telephone conversation yesterday I informed you that Siltronic Corporation should prepare a plan for abandoning monitoring well WS-14-161. The screen and sand pack interval of this monitoring well penetrates through the "deep aquitard" identified beneath the Siltronic property. The appearance of dense-non aqueous phase liquid (DNAPL) in the monitoring well indicates the installation is acting as a pathway for contamination to migrate vertically downward through the deep aquitard into deeper intervals of the Alluvium water-bearing zone.

As I indicated during yesterday's call, based on the information summarized above DEQ has determined that abandonment of WS-14-161 is required under the TCE Order (DEQ No. VC-NWR-03-16). Abandonment of WS-14-161 should be conducted consistent with OAR-690-240 and previously approved protocols for abandoning monitoring wells at the Gasco and Siltronic sites (e.g., use of organoclay-bentonite sealant).

Previous work at the adjoining Gasco Site identified potential causes for DNAPL to appear in monitoring wells including: 1) migration of DNAPL to the monitoring well location; and/or 2) vertical migration of DNAPL down the borehole due to failure of the monitoring well seal. Siltronic should assess the cause of DNAPL appearance in WS-14-161 by videoing the inside of the 2-inch monitoring well casing and screen prior to abandonment and, to the extent practicable documenting visual evidence of the depth of DNAPL occurrence during abandonment.

As indicated in your e-mail, Siltronic should submit the abandonment plan for WS-14-161 on or before February 14, 2014.

Please don't hesitate to contact me with questions regarding this e-mail.

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201
E-mail: bayuk.dana@deq.state.or.us
Phone: 503-229-5543
FAX: 503-229-6899

Please visit our website at <http://www.oregon.gov/DEQ/>



please consider the environment before printing this email

From: James Peale [<mailto:jpeale@maulfoster.com>]
Sent: Monday, January 27, 2014 4:50 PM
To: BAYUK Dana
Cc: Burr, Myron; Gladstone, Alan; Church, Brian (BCHURCH@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); Earle, William G. (WEARLE@davisrothwell.com); Kerry Gallagher
Subject: Siltronic - Conversation Confirmation

Dana –

This email is provided as a continuation to our conversation of this morning. For the purposes of documentation, Siltronic requires DEQ's email confirmation that DEQ has directed Siltronic to submit a workplan for the abandonment of nested wells WS-14-125 and WS-14-161. The workplan is due February 14, 2014. Please also confirm that the workplan should describe abandonment consistent with WRD regulations (e.g., OAR 690-220 Abandonment of Wells).

MFA is prepared to submit the workplan consistent with these requirements. Please note that if the workplan is approved, Siltronic will require written direction from DEQ in order to proceed with the abandonment.

Thanks in advance, Dana.

jp

JAMES G.D. PEALE RG, LHG | MAUL FOSTER ALONGI

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Kerry Gallagher

From: BAYUK Dana <BAYUK.Dana@deq.state.or.us>
Sent: Wednesday, June 25, 2014 4:38 PM
To: 'Burr, Myron (Myron.Burr@siltronic.com)'
Cc: 'Gladstone, Alan (AGLADSTONE@davisrothwell.com)'; James Peale; Kerry Gallagher; Bob Wyatt; Patty Dost; 'John Edwards (jedwards@anchorqea.com)'; 'Ben Hung'; John Renda; Rob Ede; 'Sheldrake, Sean'; Mullin, Jeanette; 'Peterson, Lance (PetersonLE@cdmsmith.com)'; Coffey, Scott; BYRD Kristopher R; JOHNSON Keith; GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Good afternoon Myron.

Consistent with DEQ's April 10, 2014 e-mail (see below), Siltronic Corporation (Siltronic) completed video logging of monitoring wells WS-14-125 and WS-14-161 on April 14, 2014. DEQ reviewed the video logs and concludes that dense non-aqueous phase liquids (DNAPLs) are entering the monitoring well screens and sand-packed intervals of both installations. These two monitoring wells are constructed in a single borehole and together are designated "WS-14-125/161."

In addition, as indicated in our May 20, 2014 letter commenting on the Phase 1-Step 4 Report (see footnote), DEQ concludes the screen and sand-packed intervals of monitoring wells WS-11-161 and WS-14-161 penetrate the deep aquitard and hydraulically connect the upper lower Alluvium water-bearing zone (WBZ) and the deep lower Alluvium WBZ.

Monitoring well WS-11-161 is collocated with WS-11-125 in a single borehole and the two wells together are designated "WS-11-125/161." Groundwater contamination is documented in both of these monitoring wells.

Based on the information summarized above, DEQ further concludes that:

- Monitoring wells WS-14-125 and WS-14-161 represent potential pathways for DNAPLs to migrate vertically downward into deeper intervals of the upper lower Alluvium WBZ and deep lower Alluvium WBZ; and
- Monitoring well WS-11-161 represents a potential pathway for groundwater contamination in the upper lower Alluvium WBZ to migrate vertically downward into the deep lower Alluvium WBZ.

DEQ requires that WS-11-125/161 and WS-14-125/161 be permanently abandoned through over drilling and removal consistent with OAR 690-290-0510. Siltronic should prepare and submit a work plan for this purpose for DEQ's review within 30-days of receiving this e-mail.

DEQ acknowledges and appreciates the video logs of WS-14-125/161. The logs were very useful for determining the status of the installations. Please don't hesitate to contact me with questions regarding this e-mail.

Dana

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
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Please visit our website at <http://www.oregon.gov/DEQ/>

Footnote. Anchor QEA, LLC, 2014, "Data Report: Groundwater Source Control Extraction System Test - Phase 1 Step 4 – NW Natural Gasco Site," April 10, a report prepared for NW Natural.

From: BAYUK Dana
Sent: Thursday, April 10, 2014 5:41 PM
To: 'Kerry Gallagher'
Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorage.com); Carl Stivers (cstivers@anchorage.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); BYRD Kristopher R; GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Good afternoon Kerry.

DEQ reviewed the "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR - ECSI No. 183" dated February 14, 2014 (Abandonment Plan). As we discussed by telephone the Abandonment Plan provides insufficient information regarding decommissioning procedures, particularly with respect to over-drilling and removing monitoring well construction materials.

As requested by DEQ, the Abandonment Plan includes a task to video log the WS-14-125/161 monitoring wells before they are decommissioned. During telephone discussions we concluded the video log could provide useful information for developing the approach to decommissioning the two installations. Based on this conclusion, DEQ verbally approved Siltronic moving forward with video logging. This e-mail provides DEQ's written approval for Siltronic to proceed with the video logs of WS-14-125/161.

DEQ understands video logging will be conducted on April 11, 2014. DEQ requests that three copies of the log be provided on disc for our information and use. This e-mail also acknowledges that you notified me of the work and schedule during our phone discussion on April 3rd.

Please feel free to contact me with questions regarding this e-mail.

Dana

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
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E-mail: bayuk.dana@deq.state.or.us
Phone: 503-229-5543
FAX: 503-229-6899

Please visit our website at <http://www.oregon.gov/DEQ/>

From: Kerry Gallagher [<mailto:kgallagher@maulfoster.com>]
Sent: Friday, February 14, 2014 3:58 PM
To: BAYUK Dana
Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church,

Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorgea.com); Carl Stivers (cstivers@anchorgea.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: Siltronic: Monitoring Well WS-14 Abandonment WP

Dana,

As requested, please find the attached Monitoring Well WS-14 Abandonment Work Plan for your review and approval. The required hard copies of this submittal will follow by mail.

Please call or email if you have any questions. Thank you,

KERRY-CATHLIN GALLAGHER | MAUL FOSTER & ALONGI, INC.

direct. 503 501 5229 | main office. 971 544 2139 | cell. 503 896 0255 | fax. 971 544 2140 | www.maulfooster.com
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June 27, 2014
Project No. 8128.01.08

Mr. Dana Bayuk
Oregon Department of Environmental Quality
2020 SW 4th Avenue
Portland, Oregon 97201-4987

Re: WS-11 and WS-14 Well Abandonment—Response to DEQ email dated 6/25/14
Siltronic Corporation
7200 NW Front Avenue, Portland, OR
ECSI #183

Dear Dana:

We are in receipt of your email (attached to this letter) providing direction regarding Oregon Department of Environmental Quality's (DEQ's) requirement to submit a workplan to abandon the WS-14 and WS-11 installations (which collectively include wells WS-14-125, WS-14-161, WS-11-125, and WS-11-161). For clarification, Maul Foster & Alongi, Inc. (MFA) submitted a workplan (dated February 14, 2014) for abandonment of WS-14; we will revise that document and resubmit.

In the email, DEQ concluded that the WS-14 and WS-11 wells represented potential pathways for contamination (either in the dissolved phase or as manufactured gas plant [MGP] dense non-aqueous phase liquid [DNAPL]) to migrate from the upper lower alluvium, or ULA, to the deeper lower alluvium (DLA). While Siltronic does not oppose or object to the instruction to abandon the subject installations, we offer the following information:

- 1) DEQ and Northwest Natural (NWN) have developed a conceptual site model (CSM) that posits an aquitard separating the ULA and DLA (as shown on Figure 2-3c¹, which is attached for reference). That putative aquitard supposedly influences groundwater elevations measured during the hydraulic control and containment (HC/C) system testing phases, and has been incorporated into the HC/C system model to facilitate corroboration of the measured and predicted results. However, it has not been demonstrated that this aquitard is laterally continuous such that it prevents downward flow of groundwater, or that it results in complete hydraulic separation (characteristic of an aquiclude) of the alluvium water bearing zone (AWBZ) into distinct subunits. In contrast, data collected during the remedial investigations of the Siltronic site demonstrate that the DLA is already impacted by

¹ The figure notes that geologic contacts are inferred between borings. The geologic contacts inferred for the aquitard are extended between WS-14 and WS-11 (approximately 150 feet distant) with no intermediate borings shown. The aquitard contacts are further extended laterally toward the MW-5 location, again with no intermediate borings shown. There is no lithologic data presented to support the extent or continuity of the aquitard.

chemicals (e.g., methyl tert-butyl ether and dichlorobenzene isomers) released to the surface at locations upgradient of the HC/C testing area.

- 2) Site data from the Siltronic and Gasco properties confirm that the silt and/or sandy silt layers (with lithology characteristic of an aquitard) present little if any barrier to downward migration of MGP DNAPL. MGP DNAPL is observed entering the well screen of WS-14-125, and is therefore present in the ULA in spite of multiple overlying fine grained layers. MGP DNAPL was observed entering near the bottom of the well screen in WS-14-161 at a depth of approximately 157 feet bgs (shown on the annotated Figure 2-3c, attached). This observation, documented by the video required by DEQ, indicates that MGP DNAPL is already present beneath the putative aquitard (i.e., is present in the DLA) likely having migrated downward independent of the natural lithology or the well installation. That observation is not inconsistent with the site-specific data that confirm that finer-grained layers do not prevent downward migration of MGP DNAPL.
- 3) The design, methods, and equipment for the construction of WS-11 and WS-14 were reviewed and approved by DEQ and the Oregon Water Resources Department (WRD). The video data indicate that the integrity of the WS-14 wells has not been compromised.

Again, Siltronic does not dispute DEQ's instruction to abandon the wells, and as stated above will submit a workplan consistent with the email. Siltronic strongly disagrees with the implication, intentional or otherwise, that wells installed with DEQ and WRD approval have accelerated or otherwise exacerbated vertical migration of contamination beyond the existing conditions at the site. Please contact me if you have any questions or concerns regarding this letter.

Sincerely,

Maul Foster & Alongi, Inc.



Kerry-Cathlin Gallagher
Project Scientist



James G.D. Peale, RG
Principal Hydrogeologist

Attachments: DEQ email dated 6/25/14
Figure

Dana Bayuk
June 27, 2014
Page 3

Project No. 8128.01.08

cc (e-mail only): Myron Burr, Siltronic Corporation
Alan Gladstone, Brian Church, and William Earle; Davis Rothwell Earle &
Xochihua
Chris Reive, Jordan Ramis
Keith Johnson, DEQ
Tom Gainer, DEQ
Henning Larsen, DEQ
Matt McClincy, DEQ
Kristine Koch, EPA
Sean Sheldrake, EPA
Rene Fuentes, EPA
Lance Peterson, CDM
Bob Wyatt, NW Natural
Patty Dost, Pearl Legal Group LLC
John Edwards, Anchor QEA LLC
Carl Stivers, Anchor QEA LLC
Rob Ede, Hahn and Associates, Inc.

ATTACHMENT

DEQ EMAIL DATED 6/25/14



James Peale

From: BAYUK Dana <BAYUK.Dana@deq.state.or.us>
Sent: Wednesday, June 25, 2014 4:38 PM
To: 'Burr, Myron (Myron.Burr@siltronic.com)'
Cc: 'Gladstone, Alan (AGLADSTONE@davisrothwell.com)'; James Peale; Kerry Gallagher; Bob Wyatt; Patty Dost; 'John Edwards (jedwards@anchorqea.com)'; 'Ben Hung'; John Renda; Rob Ede; 'Sheldrake, Sean'; Mullin, Jeanette; 'Peterson, Lance (PetersonLE@cdmsmith.com)'; Coffey, Scott; BYRD Kristopher R; JOHNSON Keith; GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Good afternoon Myron.

Consistent with DEQ's April 10, 2014 e-mail (see below), Siltronic Corporation (Siltronic) completed video logging of monitoring wells WS-14-125 and WS-14-161 on April 14, 2014. DEQ reviewed the video logs and concludes that dense non-aqueous phase liquids (DNAPLs) are entering the monitoring well screens and sand-packed intervals of both installations. These two monitoring wells are constructed in a single borehole and together are designated "WS-14-125/161."

In addition, as indicated in our May 20, 2014 letter commenting on the Phase 1-Step 4 Report (see footnote), DEQ concludes the screen and sand-packed intervals of monitoring wells WS-11-161 and WS-14-161 penetrate the deep aquitard and hydraulically connect the upper lower Alluvium water-bearing zone (WBZ) and the deep lower Alluvium WBZ.

Monitoring well WS-11-161 is collocated with WS-11-125 in a single borehole and the two wells together are designated "WS-11-125/161." Groundwater contamination is documented in both of these monitoring wells.

Based on the information summarized above, DEQ further concludes that:

- Monitoring wells WS-14-125 and WS-14-161 represent potential pathways for DNAPLs to migrate vertically downward into deeper intervals of the upper lower Alluvium WBZ and deep lower Alluvium WBZ; and
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DEQ acknowledges and appreciates the video logs of WS-14-125/161. The logs were very useful for determining the status of the installations. Please don't hesitate to contact me with questions regarding this e-mail.

Dana

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
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Footnote. Anchor QEA, LLC, 2014, "Data Report: Groundwater Source Control Extraction System Test - Phase 1 Step 4 – NW Natural Gasco Site," April 10, a report prepared for NW Natural.

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Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church, Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorqea.com); Carl Stivers (cstivers@anchorqea.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); BYRD Kristopher R; GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: RE: Siltronic: Monitoring Well WS-14 Abandonment WP

Good afternoon Kerry.

DEQ reviewed the "Monitoring Well WS-14 Abandonment Plan, Siltronic Corporation, 7200 NW Front Avenue, Portland, OR - ECSI No. 183" dated February 14, 2014 (Abandonment Plan). As we discussed by telephone the Abandonment Plan provides insufficient information regarding decommissioning procedures, particularly with respect to over-drilling and removing monitoring well construction materials.

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DEQ understands video logging will be conducted on April 11, 2014. DEQ requests that three copies of the log be provided on disc for our information and use. This e-mail also acknowledges that you notified me of the work and schedule during our phone discussion on April 3rd.

Please feel free to contact me with questions regarding this e-mail.

Dana

Mr. Dana Bayuk, Project Manager
NW Region Cleanup & Site Assessment Section
Oregon Department of Environmental Quality
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Portland, OR 97201
E-mail: bayuk.dana@deq.state.or.us
Phone: 503-229-5543
FAX: 503-229-6899

Please visit our website at <http://www.oregon.gov/DEQ/>

From: Kerry Gallagher [<mailto:kgallagher@maulfoster.com>]
Sent: Friday, February 14, 2014 3:58 PM
To: BAYUK Dana
Cc: James Peale; Burr, Myron (Myron.Burr@siltronic.com); Gladstone, Alan (AGLADSTONE@davisrothwell.com); Church,

Brian (BCHURCH@davisrothwell.com); Earle, William G. (WEARLE@davisrothwell.com); Chris Reive (Chris.Reive@jordanramis.com); JOHNSON Keith; koch.kristine@epa.gov; Sheldrake.Sean@epamail.epa.gov; Fuentes.Rene@epamail.epa.gov; Peterson, Lance (PetersonLE@cdmsmith.com); pdost@pearllegalgroup.com; John Edwards (jedwards@anchorgea.com); Carl Stivers (cstivers@anchorgea.com); rjw@nwnatural.com; Rob Ede (robe@hahnenv.com); GAINER Tom; LARSEN Henning; MCCLINCY Matt
Subject: Siltronic: Monitoring Well WS-14 Abandonment WP

Dana,

As requested, please find the attached Monitoring Well WS-14 Abandonment Work Plan for your review and approval. The required hard copies of this submittal will follow by mail.

Please call or email if you have any questions. Thank you,

KERRY-CATHLIN GALLAGHER | MAUL FOSTER & ALONGI, INC.

direct. 503 501 5229 | main office. 971 544 2139 | cell. 503 896 0255 | fax. 971 544 2140 | www.maulfooster.com
2001 NW 19th Avenue, Suite 200, Portland, Oregon 97209

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FIGURE



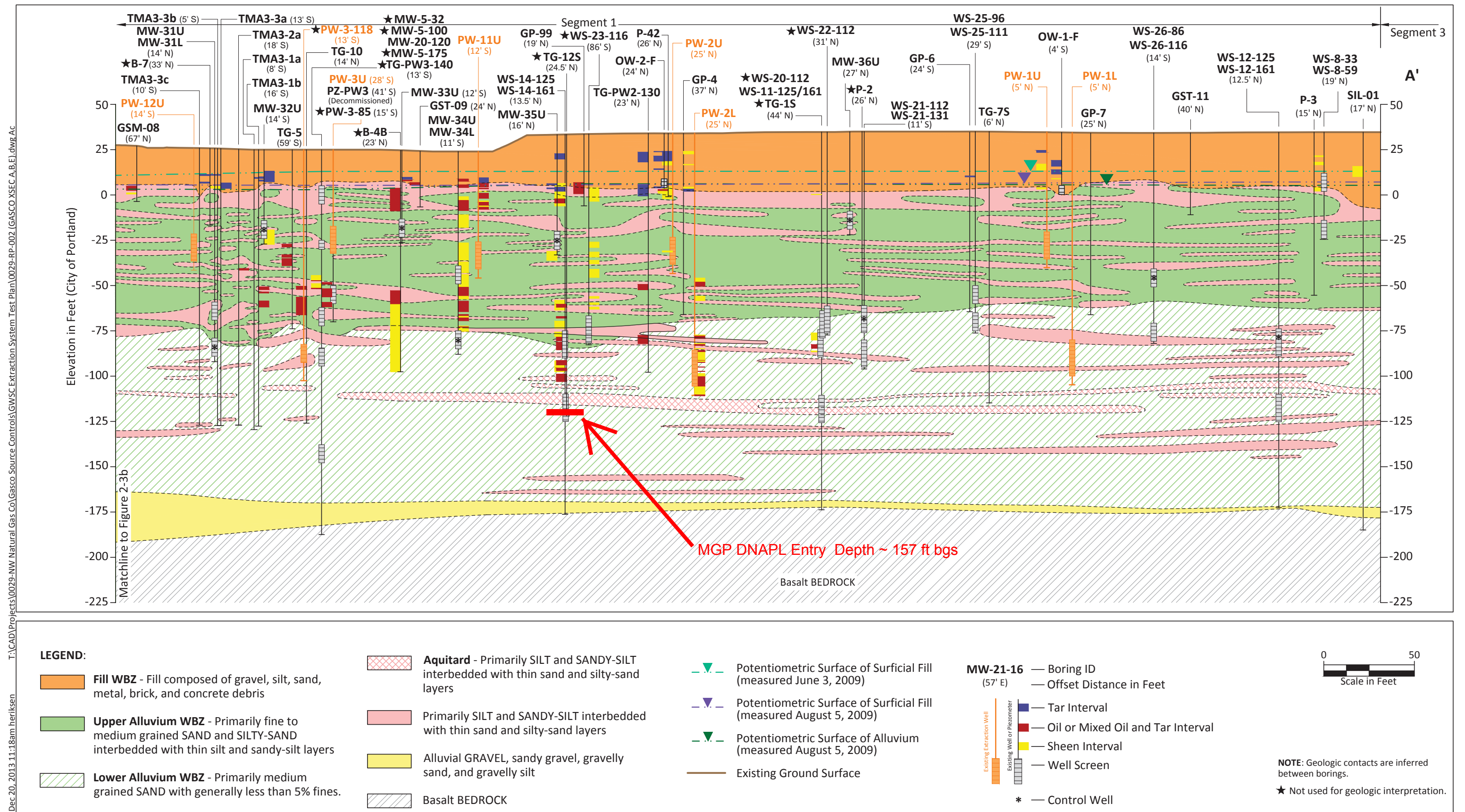


Figure 2-3c
Geologic Cross Section A-A'

Groundwater Source Control Extraction System Test Data Report
NW Natural Gasco Site

ATTACHMENT B

MONITORING WELL COMPLETION LOGS



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Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction								
		Project Number 8128.01.06			Well Number WS-11			Sheet 1 of 11		
Project Name Project Location Start/End Date Driller/Equipment Geologist/Engineer Sample Method		Wacker Siltronic Corporation 7200 Northwest Front Avenue, Portland Oregon 97210 9/21/03 to 10/3/03 Prosonic Corporation/Rotosonic Tony Silva 4x6 Core Barrel				TOC Elevation (feet NGVD) Surface Elevation (feet NGVD) Northing Easting Hole Depth Outer Hole Diam				31.8500 31.9350 7624628.3 705147.0 207.0-feet 9.0/6.0-inch
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description	
1			100%	CB		PID = 0.0			0.0 to 0.5 feet: TOPSOIL, GRAVELLY SILT (ML); grayish brown; 20% fines, non plastic; 30% gravel, medium, subangular; 50% organic debris, rootlets, woody debris; moist.	
2						PID = 0.0			0.5 to 1.5 feet: SANDY GRAVEL (GP); brownish-gray; 40% sand, fine to medium; 60% gravel, fine, subangular to subrounded; dry. (Fill)	
3						PID = 0.0			1.5 to 7.0 feet: SAND (SP); light brown; 95% sand, medium; 5% gravels, fine to medium, subrounded; moist. (Fill)	
4			100%	CB		PID = 0.0			7.0 to 12.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)	
5						PID = 0.0				
6						PID = 0.0				
7			100%	CB		PID = 0.0			12.0 to 16.0 feet: WOOD; core of wood; staining at upper end of wood; naphthalene or petroleum like odor. (Fill)	
8						PID = 0.0				
9						PID = 0.0				
10						PID = 0.0			16.0 to 17.0 feet: SAND (SP); dark brown; 100% sand, fine to medium; trace fines and gravels; moist. Possibly drilling sluff from trying to clean out the hole from the wood. (Fill)	
11						PID = 0.0				
12						PID = 0.0				
13						PID = 0.0			17.0 to 18.0 feet: WOOD; core of wood; staining at upper end of wood; naphthalene or petroleum like odor. (Fill)	
14						PID = 0.0				
15						PID = 0.0				
16			100%	CB		PID = 0.0			18.0 to 19.0 feet: SAND (SP); light brown, moist; 100% sand, fine to medium; trace fines and gravels; moist. (Fill)	
17						PID = 0.0				
18						PID = 0.0				
19			100%	CB		PID = 0.0			19.0 to 21.0 feet: SANDY SILT (ML-SM); light gray; 50% fines, non plastic; 50% sand, fine to medium; dry. Brittle, breaks apart in flakes. (Fill)	
20						PID = 0.0				
						PID = 0.0				


NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.

Approximate water level observed prior to well development.

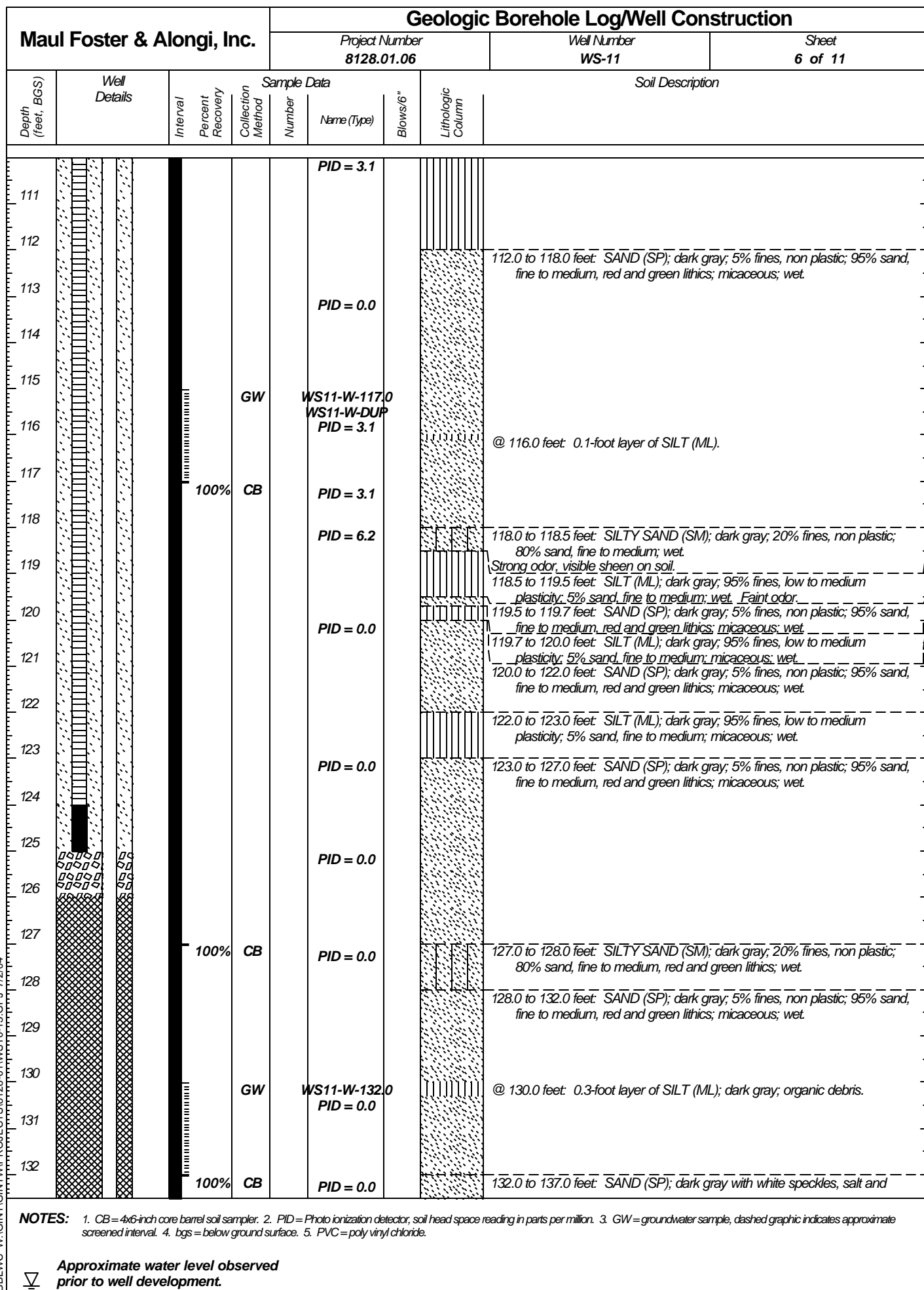
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Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction						
		Project Number 8128.01.06		Well Number WS-11		Sheet 5 of 11		
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data		Lithologic Column	Soil Description
					Number	Name (Type)		
88						PID = 0.0		fine; micaceous; wet.
89						PID = 0.0		87.5 to 88.0 feet: SILT with SAND (ML); dark gray; 70% fines, non plastic; 30% sand, fine to medium; micaceous; organic debris; moist to wet.
90								88.0 to 92.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; wet.
91								
92								
93								92.5 to 94.5 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine to medium, sand in pockets; micaceous; organic debris; wet.
94								
95						PID = 1.5		94.5 to 98.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; wet.
96								
97						PID = 1.5		
98								98.0 to 102.0 feet: SAND with SILT (SP-SM); dark gray; 15% fines, non plastic; 85% sand, fine to medium; micaceous; wet. Fines occur in nodules, up to 0.5-inches in diameter.
99								
100								
101				GW		WS11-W-102.0 PID = 4.5		
102			100%	CB		PID = 13.6		102.0 to 107.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red and green lithics; micaceous; wet.
103						PID = 0.0		
104								
105						PID = 0.0		@ 105.0 feet: 0.2-foot layer of SILT (ML); dark gray; 90% fines, 10% sand, fine, sand in pockets; wet.
106								@ 105.5 feet: 0.2-foot layer of SILT (ML); dark gray; 90% fines, 10% sand, fine, sand in pockets; wet.
107			90%	CB		PID = 0.0		107.0 to 108.0 feet: NO RECOVERY.
108						PID = 3.0		108.0 to 112.0 feet: SILT (ML); dark gray to greenish-gray; 100% fines, low to medium plasticity; micaceous; organic debris, roots, leaves; wet.
109								Visible sheen on water in soil core bag.
110								

NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.


 Approximate water level observed prior to well development.

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
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Maul Foster & Alongi, Inc.		Geologic Borehole Log/Well Construction							
		Project Number 8128.01.06		Well Number WS-11		Sheet 8 of 11			
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
156						PID = 0.0			
157						PID = 0.0			
158			100%	CB		PID = 0.0			@ 157.0 feet: 0.2-foot layer of SILT (ML). 157.2 to 160.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
159						PID = 0.0			
160						PID = 0.0			160.0 to 161.0 feet: SILT with SAND (ML); dark gray; 70% fines, low to medium plasticity; 30% sand, fine to medium; wet.
161						PID = 0.0			161.0 to 164.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
162						PID = 0.0			@162.0 feet: 0.3-foot layer of SILT (ML).
163						PID = 0.0			@162.8 feet: 0.3-foot layer of SILT (ML).
164						PID = 0.0			164.0 to 165.0 feet: SILT (ML); dark gray to greenish-gray; 90% fines, low to medium plasticity; 10% sand, fine, sand in pockets; organic debris; wet.
165				GW		WS11-W-167.0 PID = 0.0			165.0 to 165.5 feet: SANDY SILT (ML); dark gray to greenish gray; 60% fines, non plastic; 40% sand, fine; wet.
166						PID = 0.0			165.5 to 167.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, medium, green and red lithics; wet.
167			80%	CB		PID = 0.0			167.0 to 169.0 feet: NO RECOVERY.
168						PID = 0.0			
169						PID = 0.0			169.0 to 170.5 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine, green and red lithics; wet.
170						PID = 0.0			170.5 to 171 feet: SILTY SAND (SM); dark gray; 20% fines, low plasticity; 80% sand, fine; wet.
171						PID = 0.0			171.0 to 174.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, dark green and red lithics; wet.
172						PID = 0.0			
173						PID = 0.0			
174						PID = 0.0			174.0 to 174.5 feet: SILT (ML); dark gray to greenish-gray; 90% fines, medium plasticity; 10% sand, fine, sand in pockets; wet.
175						PID = 0.0			174.5 to 179.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 5% fines, non plastic; 95% sand, fine to medium, green and red lithics; wet.
176						PID = 0.0			
177			100%	CB		PID = 0.0			



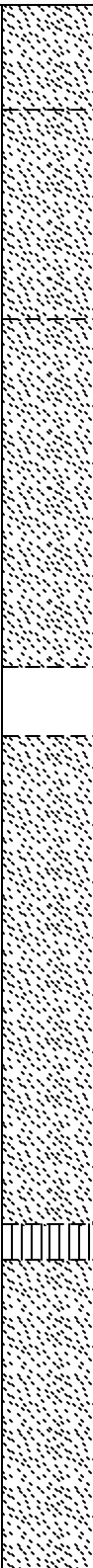


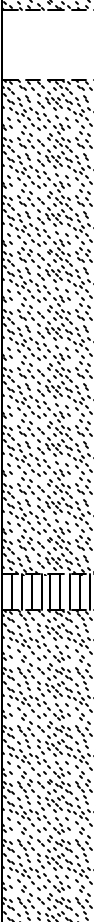


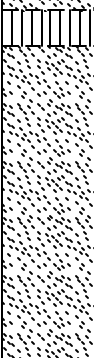
NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC=poly vinyl chloride.

Approximate water level observed prior to well development.


NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride.


Approximate water level observed prior to well development.


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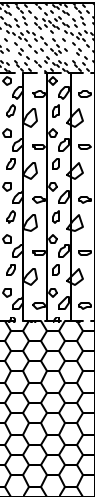

Maul Foster & Alongi, Inc.			Geologic Borehole Log/Well Construction						
			Project Number 8128.01.06			Well Number WS-11		Sheet 9 of 11	
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
178			100%	GW		PID = 0.0			179.0 to 182.0 feet: SAND (SP); dark gray with white speckles, salt and pepper look; 100% sand, medium, green and red lithics; wet.
179									
180									
181									
182									
183									
184									
185									
186									
187									
188			90%	CB		PID = 0.0			187.0 to 188.0 feet: NO RECOVERY.
189									
190									
191									
192									
193									
194									
195									
196									
197									
198			40%	CB		PID = 0.0			195.0 to 195.5 feet: SILT (ML); dark gray to greenish-gray; 95% fines, low plasticity; 5% sand, fine, sand in pockets; organic debris, roots, leaves; wet. 195.5 to 201.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine to medium, red lithics; wet.
199									
200									


NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.

 Approximate water level observed prior to well development.

NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.

 Approximate water level observed prior to well development.

Maul Foster & Alongi, Inc.				Geologic Borehole Log/Well Construction					
				Project Number 8128.01.06		Well Number WS-11		Sheet 10 of 11	
Depth (feet, BGS)	Well Details	Interval Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description	
				Number	Name (Type)	Blows/6"			
201			GW		PID = 0.0			201.0 to 204.5 feet: SILTY GRAVEL (GM); dark gray; 15% fines, non plastic; 85% gravel, fine to coarse, subrounded to rounded; wet. 204.5 to 207.0 feet: BASALT; light gray to dark gray; moist to wet; bedrock. (Columbia River Basalt Group) Significant increase in resistance, drilling hardness.	
202					PID = 0.0				
203									
204									
205									
206									
207									
Total Depth = 207.0 feet below ground surface.									
<p>WS11 Completion Details</p> <p>Oregon Water Resources Department Well Start Card Number: W147655 Oregon Water Resources Department Well Identification Number: L67076</p> <p><u>Boring:</u> 0.0 to 58.0 feet bgs: 9-inch temporary, threaded steel, isolation casing. 0.0 to 137.0 feet bgs: 8-inch temporary, threaded steel, isolation casing. 0.0 to 58.0 feet bgs: 7-inch temporary, threaded steel, isolation casing. 0.0 to 207.0 feet bgs: 6-inch temporary, threaded steel, isolation casing. 0.0 to 207.0 feet bgs: 4x6-inch core barrel sampler.</p> <p>0.0 to 1.5 feet bgs: flush mount vault and cement seal. 1.5 to 5.0 feet bgs: 3/8-inch Baroid bentonite chips hydrated with potable water. 5.0 to 102.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon. 102.0 to 104.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water. 104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack. 106.0 to 124.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack. 124.0 to 126.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water. 126.0 to 139.0 feet bgs: bentonite grout slurry, 10.3 pounds per gallon. 139.0 to 140.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water. 140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack. 142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack. 161.0 to 207.0 feet bgs: non-acetone coated, 3/8-inch bentonite chips hydrated with potable water.</p> <p><u>Well WS11-125:</u> 0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe. 109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot. 124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.</p>									
<p>NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.</p> <p> Approximate water level observed prior to well development.</p>									

Maul Foster & Alongi, Inc.					Geologic Borehole Log/Well Construction						
					Project Number 8128.01.06			Well Number WS-11		Sheet 11 of 11	
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description		
					Number	Name (Type)	Blows/6"				
<div>Well WS11-161: 0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe. 145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot. 160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.</div>											
<div>NOTES: 1. CB=4x6-inch core barrel soil sampler. 2. PID=Photo ionization detector, soil head space reading in parts per million. 3. GW=groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs=below ground surface. 5. PVC=poly vinyl chloride.</div> <div> Approximate water level observed prior to well development.</div>											

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
1 of 11

Project Name **Siltronic Corporation**
Project Location **7200 NW Front Avenue Portland, Oregon**
Start/End Date **6/22/2004 to 7/9/2004**
Driller/Equipment **Boart Longyear/Rotosonic**
Geologist/Engineer **ABC/EB**
Sample Method **4x6-inch core barrel.**

TOC Elevation (feet)
Surface Elevation (feet) **32.4**
Northing **705183.4**
Easting **7624486.1**
Hole Depth **210.0-feet**
Outer Hole Diam **10.0 to 6.0-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Blows/6"	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
1		100		CB					0.0 to 1.3 feet: GRAVELLY SILT (ML); dark yellowish-brown; 70% fines, non plastic; 30% gravels, fine, subangular; trace organic debris; dry.
2						PID = 0ppm.			1.3 to 10.0 feet: SILTY SAND (SM); dark gray; 40-50% fines, low plasticity; 50-60% sand, fine; damp.
3									
4		80%		CB					
5						PID = 0ppm.			@ 5.0-feet: Increased fines to 50%.
6		95%		CB					
7									
8						PID = 0ppm.			@ 9.5-feet: slight odor.
9									
10									10.0 to 11.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; no noticeable odor; damp.
11		100		CB					11.0 to 14.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; trace gravels, fine to coarse; trace organic debris; slight odor; tarr-like balls; damp.
12									
13						PID = 0ppm.			
14									14.0 to 16.0 feet: SAND (SP); light grayish-brown; 100% sand, fine; trace fines; trace organic debris; no noticeable odor; damp.
15									
16		100		CB		PID = 0ppm.			16.0 to 18.5 feet: GRAVELLY SAND (SP); light grayish-brown; 70% sand, fine; 30% gravels, fine to medium, subangular; trace fines; damp.
17									
18									
19						PID = 0ppm.			18.5 to 22.0 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.
20									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
2 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
21			100	CB		PID = 0ppm.			22.0 to 22.5 feet: SILT (ML); light brownish-gray; 85% fines, low plasticity; 15% sand, fine; trace gravels, fine to medium, subrounded; trace organic debris; trace woody debris; damp.
22									22.5 to 23.5 feet: SAND (SP); dark yellowish-brown; 100% sand, fine; trace fines, non plastic; damp.
23			100	CB		PID = 0ppm.			23.5 to 26.0 feet: GRAVELLY SILT (ML); light grayish-brown; 65% fines, medium plasticity; 35% gravels, fine to coarse, subangular; trace sand; moist.
24									26.0 to 29.0 feet: GRAVELLY SILT (ML); dark brownish-gray; 65% fines, medium plasticity; 35% gravels, fine to coarse, subangular; trace sand; strong sheen and odor; possible product; moist.
25			100	CB		PID = 29.7ppm.			29.0 to 33.0 feet: SANDY SILT (ML); dark brownish gray; 65% fines, low plasticity; 35% sand, fine; heavy sheen and odor; tarry-like impacts, possible product; moist.
26									33.0 to 35.0 feet: SILTY SAND (SM); dark grayish-brown; 40% fines, low plasticity; 60% sand, fine; subrounded clast approximately 5-inches in diameter; heavy sheen and odor; moist.
27			100	CB		PID = 8.1ppm.			35.0 to 35.5 feet: SAND (SP); light yellowish-brown; 100% sand, fine; trace fines, non plastic; heavy sheen and odor; moist.
28									35.5 to 38.5 feet: SAND (SP); dark brownish-gray; 100% sand, fine; trace fines, non plastic; heavy sheen and odor; globules; moist to wet.
29			90	CB		PID = 0ppm.			38.5 to 52.5 feet: SILTY SAND (SM); dark brownish-gray; 25% fines, non to low plasticity; 75% sand, fine; trace gravels, subangular; strong odor; wet.
30									
31			100	CB		PID = 8ppm.			
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
3 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
43									
44						PID = 0ppm.			
45									
46									
47						PID = 0ppm.			
48									
49									
50						PID = 0ppm.			
51									
52									
53						PID = 0ppm.			52.5 to 53.0 feet: SILT (ML); dark brownish-gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist to wet.
54									53.0 to 55.5 feet: SILTY SAND (SM); dark brownish-gray; 25% fines, non to low plasticity; 75% sand, fine; trace gravels, subangular; strong odor; wet.
55									
56		100		CB		PID = 0ppm.			55.5 to 56.0 feet: SILT (ML); dark brownish-gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist to wet.
57									56.0 to 58.0 feet: SAND WITH SILT (SP-SM); dark brownish-gray; 15% fines, non plastic; 85% sand, fine; strong odor; wet.
58									
59						PID = 0ppm.			58.0 to 66.0 feet: SILTY SAND (SM); dark brownish-gray; 15 to 20% fines, non to low plasticity; 75 to 80% sand, fine; trace cobbles, subrounded; strong odor; wet.
60									@ 60.0 feet: 3-inch silt layer.
61		90		CB					
62						PID = 0ppm.			
63									
64									@ 63.5.0 feet: odor becoming slight.
65									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.
Geologic Borehole Log/Well Construction

 Project Number
8128.01.08

 Well Number
WS-14

 Sheet
4 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
66			100	CB		PID = 0ppm.			66.0 to 67.0 feet: SANDY SILT (ML); dark grayish-brown; 80% fines, non to low plasticity; 20% sand, fine; micaceous; moderate odor; moist to wet.
67									67.0 to 69.5 feet: SAND (SP); dark grayish-brown; 5% fines, non plastic; 95% sand, fine; micaceous; no noticeable odor; moist to wet.
68						PID = 0ppm.			@ 68.0 feet: 2-inch silt layer.
69									
70									69.5 to 70.0 feet: SILT (ML); dark gray; 85% fines, low plasticity; 15% sand, fine; moist.
71			0	CB		PID = 0ppm. WS14-W-71			70.0 to 71.0 feet: SAND (SP); dark grayish-brown; 5% fines, non plastic; 95% sand, fine; micaceous; moist to wet.
72									71.0 to 75.5 feet: NO RECOVERY.
73									
74									
75									
76			100	CB		PID = 9.4ppm.			75.5 to 81.5 feet: SAND (SP); dark brownish-gray; trace to 5% fines, non plastic; 95 to 100% sand, fine; micaceous; slight odor; wet.
77									
78			100	CB		PID = 0ppm.			
79									@ 79.0 feet: trace silty balls.
80									
81						PID = 0ppm.			
82									81.5 to 82.5 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; slight odor; wet.
83									82.5 to 83.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; moderate odor; wet.
84						PID = 0ppm.			83.5 to 84.3 feet: SILT (ML); dark gray; 90% fines, medium plasticity; 10% sand, fine; slight odor; wet.
85									84.3 to 84.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; moderate odor; wet.
86						WS14-W-86			84.5 to 85.0 feet: SAND and SILT (SP-ML); dark gray; alternating 1/4-inch to 1/2-inch sand and silt layers; wet.
87						PID = 0ppm.			85.0 to 87.5 feet: SAND (SP); dark gray; 10% fines, non plastic; 90% sand, fine; micaceous; odor; wet.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
5 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Blows/6"	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
88		100		CB					87.5 to 88.0 feet: SANDY SILT (ML); gray; 60% fines, low to medium plasticity; 40% sand, fine; micaceous; moderate odor; wet.
89									88.0 to 89.5 feet: SILTY SAND (SM); gray; 15% fines, non plastic; 85% sand, fine; micaceous; slight odor; wet.
90						PID = 13ppm.			89.5 to 90.5 feet: SILT (ML); dark gray; 100% fines, medium plasticity; trace sand, fine; micaceous; moist.
91									90.5 to 92.0 feet: SILTY SAND (SM); gray; 15% fines, non plastic; 85% sand, fine; micaceous; sheen and strong odor; wet.
92									92.0 to 96.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand, fine; micaceous; sheen and strong odor; moist. Several zones of 2-inch pockets with fine sand.
93						PID = 28.3ppm.			
94									
95									
96		100		CB		PID = 0ppm.			96.0 to 98.0 feet: SANDY SILT (ML); dark gray; 85% fines, medium plasticity; 15% sand, fine; micaceous; strong odor; moist.
97									98.0 to 102.0 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; strong odor; wet. Between 99.0 and 99.5 feet several 1/2-inch silt bands intermixed with sand.
98									
99						PID = 0ppm.			
100									
101									@ 100.5 feet: 1-inch silt layer.
102						WS14-W-101			102.0 to 105.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; sheen and strong odor; wet.
103		100		CB		PID = 0ppm.			
104									
105						PID = 84ppm.			
106									105.0 to 105.5 feet: SILT (ML); gray; 90% fines, low plasticity; 10% sand, fine; strong odor; moist.
107									105.5 to 106.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; sheen and strong odor; wet.
108									106.0 to 108.0 feet: SILT (ML); gray; 100% fines; low plasticity; trace sand, fine; trace rootlets; moderate odor; moist.
109									@ 107.0 feet: 2-inch gray sand layer with strong odor.
110						PID = 9.5ppm.			108.0 to 108.5 feet: SILTY SAND (SM); gray; 30% fines, low plasticity; 70% sand, fine; sheen and strong odor; wet.
110									108.5 to 110.5 feet: SILT (ML); gray; 100% fines; low plasticity; trace sand, fine; sheen and strong odor; moist.
110									@ 109.0 feet: 4-inch silty sand layer with sheen and strong odor.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
6 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data		Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)			
111		100		CB		PID = 0ppm.			110.5 to 111.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; slight odor; wet. 111.0 to 113.0 feet: NO RECOVERY; sluff.
112									
113						PID = 0ppm.			113.0 to 114.0 feet: SANDY SILT (ML); dark brownish-gray; 60% fines, non to low plasticity; 40% sand, fine; micaceous; faint odor; moist to wet.
114									114.0 to 120.5 feet: SAND (SP); dark brownish-gray; 5% fines, non plastic; 95% sand, fine; micaceous; no noticeable odor; wet.
115									
116						PID = 0ppm.			@ 116.0 feet: 3-inch silt layer.
117									
118									
119						PID = 0ppm.			
120						WS14-W-120			
121		100		CB					120.5 to 121.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; moist.
122									121.0 to 132.5 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
123									
124						PID = 0ppm.			@ 124 feet: sheen and strong odor present.
125									
126									
127						PID = 0ppm.			
128									
129									
130						PID = 0ppm.			@ 130 feet: sheen and strong odor fading.
131									
132									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
7 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
133						PID = 0ppm.			132.5 to 133.5 feet: SILT (ML); dark grayish-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.
134									133.5 to 134.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet.
135									134.0 to 134.5 feet: SILT (ML); dark grayish-brown; 90% fines, low plasticity; 10% sand, fine; micaceous; moist.
136		0	CB						134.5 to 136.0 feet: SAND (SP); dark gray; 100% sand, fine; trace fines; micaceous; wet. @ 135.5 feet: 3-inch silt layer.
137									136.0 to 138.5 feet: NO RECOVERY.
138									
139		100	CB			PID = 0ppm.			138.5 to 141.5 feet: SAND (SP); dark gray; 5% fines, non plastic; 95% sand, fine; micaceous; slight odor; wet.
140									
141									
142		100	CB			PID = 0ppm. WS14-W-142			141.5 to 142.0 feet: SILT (ML); dark brownish-gray; 85% fines, low plasticity; 15% sand, fine; micaceous; moist. @ 141.7 feet: 1-inch sand layer.
143									142.0 to 143.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
144									143.0 to 145.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist. @ 143.5 feet: 3-inch sand layer.
145						PID = 0ppm.			145.0 to 148.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; intermixed with 1-inch to 2-inch sand layers; moist.
146									
147									
148									
149						PID = 0ppm.			148.5 to 149.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
150		100	CB			WS14-W-150			149.0 to 149.5 feet: SILT (ML); gray; 100% fines, medium to high plasticity; trace sand; moist.
151									149.5 to 150.0 feet: SAND (SP); gray; 100% sand, fine; trace fines; wet.
152						PID = 0ppm.			150.0 to 167.0 feet: SAND (SP); gray; 5% fines, non plastic; 95% sand, fine to medium; trace wood debris; wet. @ 152.0 feet: 2-inch silt layer.
153									
154									
155									

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
8 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Lithologic Column	Soil Description
					Number	Name (Type)	Blows/6"		
156						PID = 0ppm.			@ 155.0 feet: Wood fragments.
157									
158						PID = 0ppm.			@ 157.0 feet: 3-inch silt layer.
159									
160									
161						PID = 0ppm.			
162									
163									
164						PID = 0ppm.			
165									
166									
167						PID = 0ppm.			167.0 to 167.5 feet: NO RECOVERY; sluff.
168						WS14-W-167			167.5 to 169.5 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
169									
170						PID = 0ppm.			169.5 to 172.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; increasing fines to 15%; wet.
171									
172									172.0 to 173.0 feet: SILTY SAND (SM); gray; 35% fines, non plastic; 65% sand, fine; wet.
173						PID = 0ppm.			173.0 to 182.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
174									
175									
176						PID = 0ppm.			
177									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
9 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Sample Data			Blows/6"	Lithologic Column	Soil Description
				Collection Method	Number	Name (Type)			
178						PID = 0ppm.			
179									
180									
181									
182		80	CB			PID = 0ppm. WS14-W-182			182.0 to 185.5 feet: NO RECOVERY; sluff.
183									
184									
185									
186						PID = 0ppm.			185.5 to 186.5 feet: Sand (SP); gray; 100 % sand, fine; micaceous; trace fines; wet.
187									186.5 to 188.0 feet: SILTY SAND (SM); gray; 35% fines, low plasticity; 65% sand, fine; wet.
188									
189						PID = 0ppm.			188.0 to 190.0 feet: SILT (ML); gray; 100% fines, low to medium plasticity; damp. @ 189.0 feet: 2-inch fine, sand layer.
190									
191									190.0 to 195.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
192		100	CB			PID = 0ppm.			
193									
194									
195						PID = 0ppm.			195.0 to 196.0 feet: SILTY SAND (SM); gray; 50% fines, low plasticity; 50% sand, fine; wet.
196									196.0 to 197.0 feet: SAND (SP); gray; 100% sand, fine; micaceous; trace fines; wet.
197		90	CB			WS14-W-197			197.0 to 198.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; damp.
198						PID = 0ppm.			198.0 to 204.0 feet: SAND (SP); gray; 100% sand, fine to medium; micaceous; trace fines; wet.
199									
200									

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number
8128.01.08

Well Number
WS-14

Sheet
10 of 11

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)				
201						PID = 0ppm.				
202										
203										
204						PID = 0ppm.				
205										
206										
207										
208										
209						WS14-W-208				
210										

Total Depth = 210.0 feet.

WS14 Completion Details

Oregon Water Resources Department Well Start Card Number: 164731
Oregon Water Resources Department Well Identification Number:
L67967

Boring:

0.0 to 69.0 feet bgs: 10-inch temporary, threaded steel, isolation casing.
0.0 to 110.0 feet bgs: 9-inch temporary, threaded steel, isolation casing.
0.0 to 135.0 feet bgs: 8-inch temporary, threaded steel, isolation casing.
0.0 to 210.0 feet bgs: 6-inch temporary, threaded steel, isolation casing.
0.0 to 210.0 feet bgs: 4x6-inch core barrel sampler.

0.0 to 1.5 feet bgs: flush mount vault and cement seal.
1.5 to 7.0 feet bgs: 1/4-inch Baroid bentonite chips hydrated with potable water.
7.0 to 104.0 feet bgs: bentonite grout slurry, 10.0 pounds per gallon.
104.0 to 106.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
106.0 to 125.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
125.0 to 140.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.
140.0 to 142.0 feet bgs: 20x40 washed Colorado silica sand, secondary filter pack.
142.0 to 161.0 feet bgs: 10x20 washed Colorado silica sand, primary filter pack.
161.0 to 210.0 feet bgs: non-IPA coated, 1/4-inch bentonite pellets hydrated with potable water.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Sample Data			Blows/6"	Lithologic Column	Soil Description
					Number	Name (Type)				

Well WS14-125:
 0.0 to 109.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
 109.0 to 124.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
 124.0 to 125.0 feet bgs: 2-inch diameter, stainless steel sump.

Well WS14-161:
 0.0 to 145.0 feet bgs: 2-inch diameter, schedule 40 PVC blank riser pipe.
 145.0 to 160.0 feet bgs: 2-inch diameter, stainless steel wire wrapped screen, 0.010-slot.
 160.0 to 161.0 feet bgs: 2-inch diameter, stainless steel sump.

NOTES: 1. CB = 4x6-inch core barrel soil sampler. 2. PID = Photo ionization detector, soil head space reading in parts per million. 3. GW = groundwater sample, dashed graphic indicates approximate screened interval. 4. bgs = below ground surface. 5. PVC = poly vinyl chloride. 6. Odor characteristic of manufactured gas plant waste.

ATTACHMENT C

OWRD WELL LOGS



STATE OF OREGON
MONITORING WELL REPORT
(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT: WELL NO. W.S. 11
Name Wacker S. Ironic Corp
Address 2200 N.W. Front Ave
City Portland State Or Zip 97210

(2) TYPE OF WORK:
☒ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☐ Abandonment

(3) DRILLING METHOD

☐ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Hollow Stem Auger ☒ Other Senic

(6) LOCATION OF WELL By legal description

Well Location: County Multnomah
Township 1N (N or S) Range 1W (E or W) Section 13
1. SW 1/4 of SW 1/4 of above section.
2. Either Street address of well location 7200 NW Front Ave Portland Or.
or Tax lot number of well location 1200

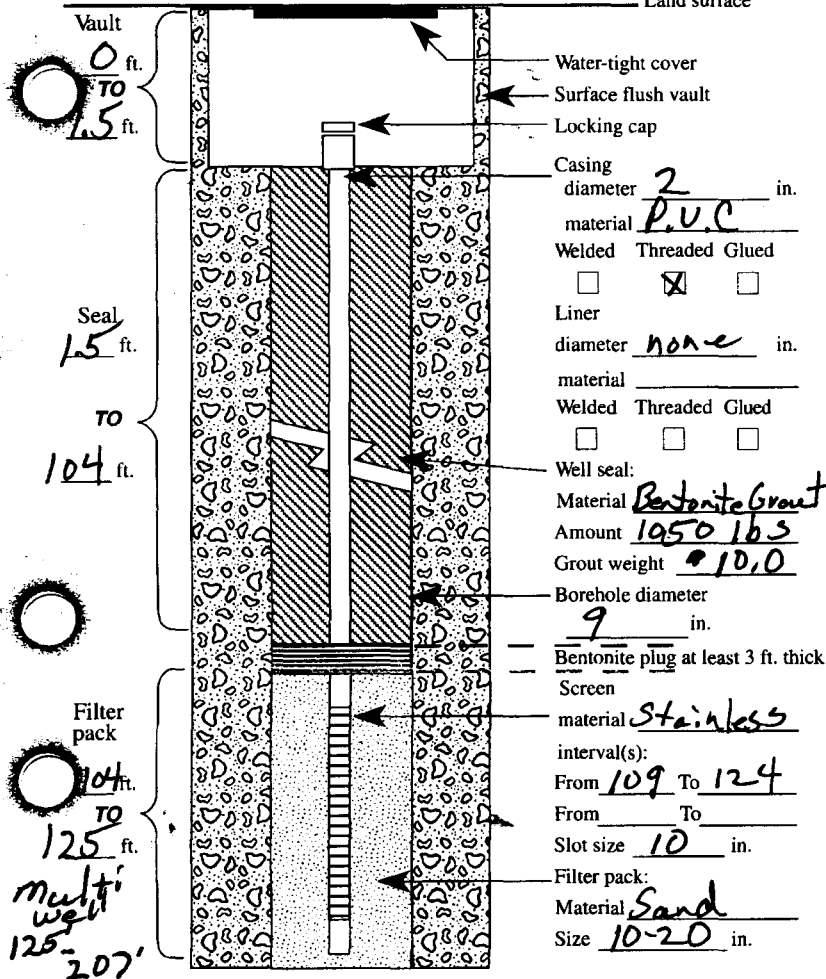
3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL:

22.4 Ft. below land surface. Date 10-20-03
Artesian Pressure _____ lb/sq. in. Date _____

BORE HOLE CONSTRUCTION

Special Standards ☒ Yes ☐ No
Depth of completed well 125 ft. Land surface



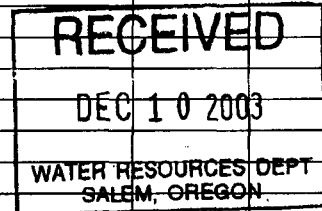
(8) WATER BEARING ZONES:

From	To	Est. Flow Rate	SWL
<u>109</u>	<u>124</u>	<u>1.0</u>	<u>22.4</u>
RECEIVED			
JUL 06 2004			

(9) WELL LOG:

Ground elevation WATER RESOURCES DEPT SALEM, OREGON

Material	From	To	SWL
<u>Topsoil</u>	<u>0</u>	<u>1</u>	
<u>Sand Light Brown</u>	<u>1</u>	<u>30</u>	
<u>Silt with layers of</u>	<u>30</u>		
<u>Sand</u>		<u>52</u>	
<u>Sand Black with</u>	<u>52</u>		
<u>Layer of silt</u>		<u>187</u>	
<u>Silty Gravel</u>	<u>187</u>	<u>203</u>	
<u>Basalt</u>	<u>203</u>	<u>207</u>	



Date started 9-21-03 Completed 10-21-03

(5) WELL TEST:

☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
Permeability _____ Yield 1.0 GPM
Conductivity 576 uS/cm PH 6.43
Temperature of water 16.03 °F/C Depth artesian flow found _____ ft.
Was water analysis done? ☐ Yes ☒ No
By whom? _____
Depth of strata to be analyzed. From _____ ft. to _____ ft.
Remarks: _____

Name of supervising Geologist/Engineer Mark Easter & Alongi
ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.
Signed Donoff MWC Number 10192
Date _____

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

Signed Mark Easter & Alongi MWC Number 10540
Date 7/2/04
SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

MULT 72126
MULT 72126

Security Gate

Willamette River

I.D. L67076 I.D. #L67100

WS 11 WS 12

Parking lot #1

Parking lot #2

Security Gate

I.D. L67091
WS 13

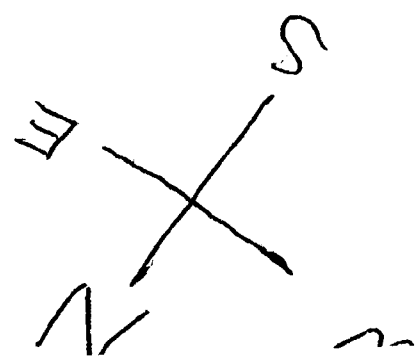
WS 10
ID L64996

Hydrogen tank

RECEIVED

DEC 10 2003

WATER RESOURCES DEPT
SALEM, OREGON



MULT 72126



Oregon

Theodore R. Kulongoski, Governor

Water Resources Department

Commerce Building
158 12th Street NE
Salem, OR 97301-4172
503-378-3739
FAX 503-378-8130

September 2, 2003

MARK KNOLLE #10437
C/O PROSONIC CORP
305 E. COMSTOCK DR
CHANDLER AZ 85225

FINAL ORDER

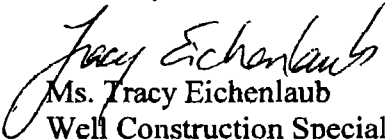
Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card numbers 147653-147655 is approved for the following: multiple completion wells, the wells will have two (2) 2 inch wells in each borehole. See Oregon Administrative Rule (OAR) 690-240-0410(5). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 378-8455 ext 283, or by e-mail at tracy.l.eichenlaub@wrdd.state.or.us.

Sincerely,



Ms. Tracy Eichenlaub
Well Construction Specialist
Enforcement Section

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for judicial review or petition the Director for reconsideration of this order.

MULT 72126

**Oregon**

Theodore R. Kulongoski, Governor

Water Resources Department

Commerce Building
158 12th Street NE
Salem, OR 97301-4172
503-378-3739
FAX 503-378-8130

October 6, 2003

MARK KNOLLE #10437
C/O PROSONIC CORP
305 E. COMSTOCK DR
CHANDLER AZ 85225

FINAL ORDER

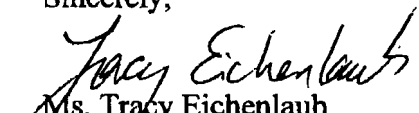
Dear Mr. Knolle:

The special standard request you submitted for owner: Wacker Siltronic, start card number 147655 is approved for the following: use of bentonite below 50 feet and through more than 25 feet of water, 3/8 inch bentonite pellets will be used to abandon the bottom of the hole from 206 feet to 160 feet. See Oregon Administrative Rule (OAR) 690-240-0475(3). Your special standard request form is enclosed.

The Well Construction Standards serve to protect ground water resources. By approving and issuing this special construction standard the Oregon Water Resources Department is not representing that a well constructed in accordance with this condition will maintain structural integrity or that it meets engineering standards. The well constructor/or landowner is responsible for ensuring that a well is constructed in a manner that protects ground water resources as required under Oregon Administrative Rules 690-200 through 690-240.

If you have any questions concerning this letter, I may be contacted at (503) 986-0851, or by e-mail at tracy.l.eichenlaub@wrdd.state.or.us.

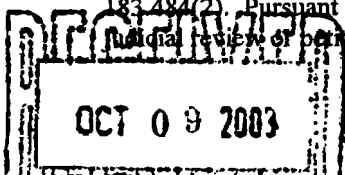
Sincerely,


Ms. Tracy Eichenlaub
Well Construction Specialist
Enforcement Section

enclosure

cc: Dorothy Pedersen, NW Region Monitor Well Inspector

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137.004-0080 and OAR 690-01-0005 you may either petition for judicial review or petition the Director for reconsideration of this order.



STATE OF OREGON
MONITORING WELL REPORT
(as required by ORS 537.765 & OAR 690-240-095)

Instructions for completing this report are on the last page of this form.

(1) OWNER/PROJECT: WELL NO. WS-13
Name Siltronic Corporation
Address 7200 NW Front Ave
City Portland State OR Zip 97210

(2) TYPE OF WORK:

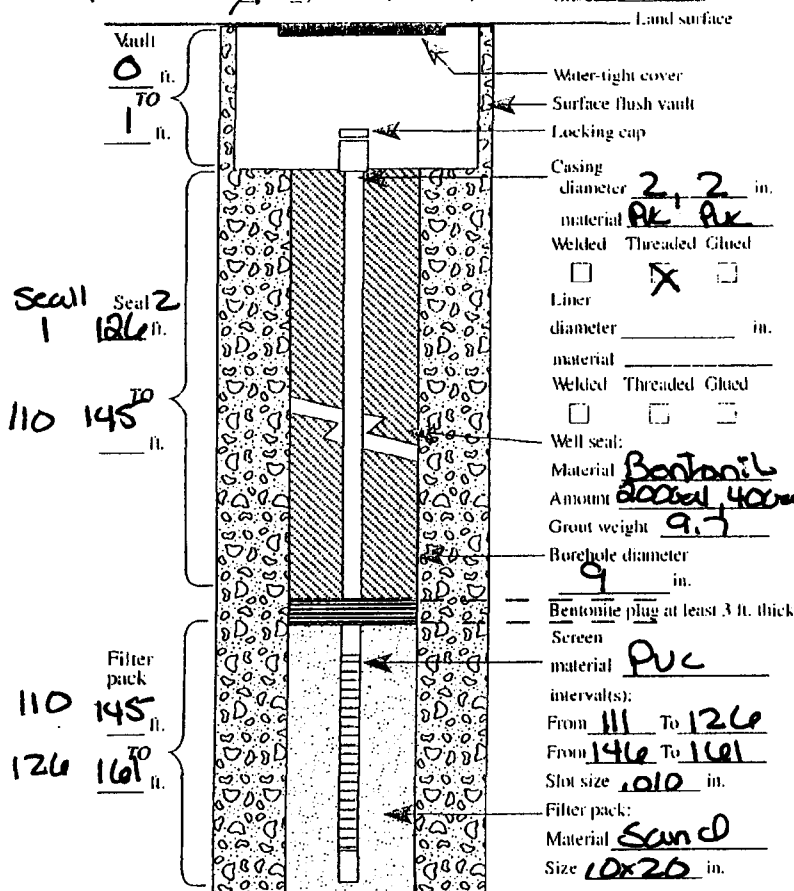
- ☒ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☐ Abandonment

(3) DRILLING METHOD

- ☐ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Hollow Stem Auger ☒ Other Sonic

(4) BORE HOLE CONSTRUCTION

Special Standards ☒ Yes ☐ No Depth of completed well 161 ft.



(5) WELL TEST:

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
Permeability Yield GPM
Conductivity PH
Temperature of water Depth artesian flow found ft.
Was water analysis done? ☐ Yes ☒ No
By whom?
Depth of strata to be analyzed ft.
Remarks: NOT OBSERVED

Name of supervising Geologist/Engineer

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT

L 16967 73526
Start Card # 164731

(6) LOCATION OF WELL By legal description

Well Location: County Multnomah
Township 1 (N or S) Range 1 (E or W) Section 13
1. NW 1/4 of NW 1/4 of above section.
2. Either Street address of well location 7200 NW Front Ave
or Tax lot number of well location 1200

3. ATTACH MAP WITH LOCATION IDENTIFIED. Map shall include approximate scale and north arrow.

(7) STATIC WATER LEVEL:

Below land surface NOT OBSERVED
Artesian Pressure lvsq. in. Date

(8) WATER BEARING ZONES:

Depth at which water was first found

From	To	Est. Flow Rate	SWL
NOT OBSERVED			

(9) WELL LOG:

Ground elevation

Material	From	To	SWL
Sand & Gravel	0	40	
Sand	40	204	
Basalt	204		
Naked Well Special Standard Request on file			
Drilled well to 204' back-filled with bentonite from 204' to 161'			
Bentonite	161	204	
RECEIVED			
AUG 09 2004			
WATER RESOURCES DEPT SALEM, OREGON			

Date started 6/27/04 Completed 7/18/07

(unbonded) Monitor Well Constructor Certification:

I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to the best knowledge and belief.

Signed MWC Number 10570
Date 7/21/07

(bonded) Monitor Well Constructor Certification:

I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

Signed MWC Number 10241
Date 7/21/07

SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

Willamette River

MULT 73686

I.D. #L67100

I.D. L67076

WS 12

WS 11

Parking lot #1

WS 14

Parking lot #2

Security Gate

I.D. L67091

WS 13

WS 10
IDL64996

Hydrogen tank

RECEIVED

DEC 10 2003

WATER RESOURCES DEPT
SALEM, OREGON

RECEIVED

AUG 09 2004

WATER RESOURCES DEPT
SALEM, OREGON



ATTACHMENT D

VIDEO LOG OF WS-14-125 AND WS-14-
161 (DVD)

